

Claims

1. Hydraulic processing tong for processing of workpieces, with a first tool part (11, 32) or a first tool support, which is located on a first tong arm (8.3) and can be advanced in relation to an opposing tong arm (8.1), namely for closing a work area or work gap, with a hydraulic actuating device (5, 40) for applying a force exerted in the direction of the second tong arm (8.1) to the first tool part (11, 32) or to an element of this tool part, characterized in that in addition to the hydraulic actuating device (5, 40) there is a closing drive (12, 13, 16; 35, 36, 37) for advancing the first tool part (11, 32) and that means are provided for coupling the first tool part (11, 32) after advancing with the hydraulic actuating device (5, 40).
2. Processing tong as claimed in claim 1, characterized in that the first tool part or the element of the first tool part (11) is an axially movable press ram or plunger (14), which with a first end (14.3) or a tool fixed there and an opposing workpiece assembly (8.2) form the working gap and with the first end (14.3) can moved toward and away from the workpiece assembly (14.2), and that the hydraulic actuating device (5) for the working stroke can be connected by a driven linkage with the plunger or ram (14).
3. Processing tong as claimed in claim 2, characterized in that the workpiece assembly is formed by a second tool part (30).
4. Processing tong as claimed in one of the foregoing claims, characterized in that at least one pressure transfer element (23) is provided for, which when the press ram (14) is advanced, produces a force-transferring connection between the actuating element (5.1) of the hydraulic actuating device (5) and a drive surface (14.4) of the ram (14) which (surface) is at an axial distance from this actuating

- element (5.1).
5. Processing tong as claimed in one of the foregoing claims, characterized in that with the closing drive (12, 13, 16) also the first tool part (11) can be moved axially between a starting position and the working position and for this purpose can move axially in an outer second tool part (10).
 6. Processing tong as claimed in one of the foregoing claims, characterized in that the pressure transfer element or coupling (23) can be moved between a starting position, in which the pressure transfer element (23) is located outside of the movement space of the ram (14) and/or of the first tool part (11) and a working position, in which the pressure transfer element (23) is located between the drive surface (14.4) of the ram (14) and the actuating element (5.1).
 7. Processing tong as claimed in claim 6, characterized in that the pressure transfer element (23) can be moved radially to the axis of the ram (14) between the starting position and the working position.
 8. Processing tong as claimed in any of the foregoing claims, characterized in that the actuating element is a hydraulic actuating element.
 9. Processing tong as claimed in one of the foregoing claims, characterized in that the actuating element is a pressure piston (5.1) of a hydraulic cylinder (5).
 10. Processing tong as claimed in claim 8, characterized in that the pressure piston (5.1) is part of a slave cylinder (5) actuated by a working cylinder (4) or a working piston (4.1) located there and that the working cylinder is spatially separated from the tool (9) or the processing tong (3).

11. Processing tong as claimed in one of the foregoing claims, characterized in that the drive surface of the ram (14) is formed by a second end (14.4) of the ram (14) facing away from the first end (14.3).
12. Processing tong as claimed in one of the foregoing claims, characterized in that the ram (14) can be moved axially, with its first end (14.3) or with a ram section (14.2) possessing this end, in a jointing channel (15) formed in the first tool part (11).
13. Processing tong as claimed in one of the foregoing claims, characterized in that the first tool part (11) forms a ring-shaped support or hold-down surface enclosing one opening of the jointing channel (15).
14. Processing tong as claimed in one of the foregoing claims, characterized in that the closing drive has a piston-cylinder unit between the ram (14) and the first tool part (11).
15. Processing tong as claimed in claim 13, characterized in that the piston-cylinder unit is a pneumatic piston-cylinder unit.
16. Processing tong as claimed in claim 13 or 14, characterized in that the piston-cylinder unit is a double-acting unit.
17. Processing tong as claimed in one of the claims 13-15, characterized in that the piston-cylinder unit consists of a piston (13) located on the ram (14), which (piston) can be moved axially in a cylinder chamber (12) formed in the first tool part (11).
18. Processing tong as claimed in one of the foregoing claims, characterized in that the closing drive has a further drive element (16) working between the first tool part (11) and the second tool part (10) or a holder (8).

19. Processing tong as claimed in claim 13, characterized in that the further drive element (16) is a cylinder, for example a pneumatic cylinder or a linkage.
20. Processing tong as claimed in one of the foregoing claims, characterized in that the force transfer element or coupling element is a block (23) that can be inserted in a space between the hydraulic actuating device (5) or its actuating element (5.1) and the drive surface (14.4).
21. Processing tong as claimed in one of the foregoing claims, characterized in that the piston (4.1) of the working cylinder (4) can be actuated by means of a motorized drive, for example by means of a motor-driven spindle.
22. Processing tong as claimed in one of the foregoing claims, characterized in that the piston (4.1) of the working cylinder (4) can be actuated pneumatically.
23. Processing tong as claimed in one of the foregoing claims, characterized in that the actuating element (40) can be moved between a starting position, in which the actuating element (40) is located to the side of the axis of the die (31) and a working position, in which the actuating element (40) is located on one axis with the die (31).
24. Processing tong as claimed in claim 22, characterized in that the actuating element (40) can be moved radially to the axis of the ram (31) or radially to the axis of the closing movement between the starting position and the working position.
25. Processing tong as claimed in claim 23, characterized in that the actuating element (40) can be moved in a guide (38) or on a tong

arm (8.3).

26. Processing tong as claimed in one of the foregoing claims, characterized in that the press ram or the die (31) can be moved axially by means of an auxiliary drive (37) for the closing movement.
27. Processing tong as claimed in claim 25, characterized in that the auxiliary drive (37) is linked by means of a gearwheel drive with the press ram (14) or the die (31).
28. Processing tong as claimed in one of the foregoing claims, characterized in that the actuating element is an electric motor-driven or pneumatic drive.
29. Processing tong as claimed in one of the foregoing claims, characterized in that the actuating element is a toggle joint drive (45).